The Nat Gas US48 HDD Anomaly Signal.

Four years of winter heating-demand anomaly reads mapped onto thirty-six years of NYMEX natural gas forward returns.

David Stendahl DOT Market Lab Analytics DOT November 4, 2026

What this signal is

Why residential and commercial heating is the largest US winter gas-demand pillar, and why the ANOMALY against climatology is the signal rather than the raw HDD count. Why underlying weather data begins 2022 and what that means for sample depth. Why summer firings are weak-signal despite the formal state read.

US residential and commercial heating is the largest winter nat gas-demand pillar; roughly 50 percent of US homes heat with gas. Climatology-normal HDD is already priced through the seasonal curve. What moves gas is the ANOMALY against normal. Positive anomaly means colder than normal, which drives above-trend heating demand, storage draw, and bullish gas. Negative anomaly means warmer than normal, which drives below-trend heating and bearish gas.

Current reading as of November 2, 2026: composite +0.241, Normal, 1 trading day in band. HDD anomaly mildly positive, inside the state band. US HDD is running a touch cold against seasonal norm but not at anomaly-firing extremity.

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How the inputs compose

The signal reads NOAA CPC weekly US48 HDD actual minus climatology-normal, runs a 52-week rolling z-score with a 21-week minimum sample, and tanh-bounds the z to plus-or-minus one. Positive composite means cold anomaly (bullish gas). Negative composite means warm anomaly (bearish gas). State machine uses plus-or-minus 0.5 as the Extreme POS / Extreme NEG band boundaries.

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What the state-conditional returns have actually done

Nat gas forward 60-day benchmark across the 9,134-day sample has a mean of minus 1.06 percent and a median of minus 0.84 percent; both reference points anchor the regime edges below.

State Warm anomaly (phase minus one, composite below minus 0.5) covers 5.3 percent of the sample and delivers minus 4.42 percent forward 60-day, a minus 3.36 percentage point edge below the mean baseline. State Normal covers 90.0 percent and delivers minus 0.84 percent, essentially on top of baseline. State Cold anomaly (phase plus one) covers 4.7 percent and delivers minus 1.90 percent, a minus 0.84pp edge. The signal is 90 percent NEUTRAL by design because the 52-week z-score only breaches the plus-or-minus 0.5 band on genuine weather anomaly.

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Three cases that frame how to read this signal

Case 1: August 2022. The Europe-LNG-boom warm anomaly.

The composite moved into state Warm anomaly on August 22, 2022 as US HDD ran below climatology-normal during the late-summer transition. Over the 30-trading-session window NG ratio-adjusted continuous fell from 13.53 to 10.30, a minus 23.8 percent move. Heating demand deficit against the Europe-LNG-boom supply tightness resolved toward storage builds.

Case 2: June 2022. The pre-Freeport cold anomaly.

The composite moved into state Cold anomaly on June 21, 2022 as a cooling anomaly fed storage-draw expectations. Over the 24-trading-session window NG ratio-adjusted continuous rallied from 10.53 to 12.43, a plus 18.1 percent move before the Freeport LNG terminal outage reversed the picture.

Case 3: June 2024. A cautionary summer cold-anomaly firing.

The composite moved into state Cold anomaly on June 17, 2024 as HDD ran modestly above summer norm. Over the 34-trading-session window NG ratio-adjusted continuous fell from 4.17 to 3.16, a minus 24.3 percent move despite the cold read. Lesson: the HDD anomaly is a HEATING-demand signal; summer firings are low-value signal because summer gas demand is cooling-driven (CDD), not heating-driven.

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How to use the signal today

The composite reading is mildly positive but inside the Normal band. Watch the Thursday NOAA CPC release during October-April heating season. Pair with the US power-burn composite and the ERCOT regional demand composite for a full US gas-demand view across residential heating, national power-sector burn, and regional load.

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Methodology notes

Data source: NOAA Climate Prediction Center weekly US48 HDD release (weather_data.db.NOAA_HDD_CDD_WEEKLY). Weather data history begins 2022-01. Benchmark: NYMEX natural gas ratio-adjusted continuous (CSI feed NG_1220BD). Forward 60-day returns computed as the 60-day forward percentage change. Composite: 52-week rolling z-score of (HDD actual minus HDD normal), tanh-scaled.

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What this signal does not cover

This signal does not cover: regional HDD breakouts (Northeast vs Midwest vs South); CDD cooling-demand (that lives in separate signals); real-time short-term weather forecasts (CPC runs weekly only); LNG-export-driven demand pulls (those sit in separate LNG signals); storage inventory itself (lives in the EIA weekly storage signal family). This signal is one of three in the NG demand stack; it does NOT substitute for the power-burn or ERCOT signals.